**Drug Therapy Protocols: Oxygen**

<table>
<thead>
<tr>
<th>Policy code</th>
<th>DTP_OXYG_0119</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date</td>
<td>January, 2019</td>
</tr>
<tr>
<td>Purpose</td>
<td>To ensure a consistent procedural approach to oxygen administration.</td>
</tr>
<tr>
<td>Scope</td>
<td>Applies to all Queensland Ambulance Service (QAS) clinical staff.</td>
</tr>
<tr>
<td>Health care setting</td>
<td>Pre-hospital assessment and treatment.</td>
</tr>
<tr>
<td>Population</td>
<td>Applies to all ages unless specifically mentioned.</td>
</tr>
<tr>
<td>Source of funding</td>
<td>Internal – 100%</td>
</tr>
<tr>
<td>Author</td>
<td>Clinical Quality &amp; Patient Safety Unit, QAS</td>
</tr>
<tr>
<td>Review date</td>
<td>January, 2022</td>
</tr>
</tbody>
</table>

While effort has been made to contact all copyright owners this has not always been possible. The QAS would welcome notification from any copyright holder who has been omitted or incorrectly acknowledged.

All feedback and suggestions are welcome. Please forward to: Clinical.Guidelines@ambulance.qld.gov.au

**Disclaimer**

The Digital Clinical Practice Manual is expressly intended for use by QAS paramedics when performing duties and delivering ambulance services for, and on behalf of, the QAS.

The QAS disclaims, to the maximum extent permitted by law, all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages and costs incurred for any reason associated with the use of this manual, including the materials within or referred to throughout this document being in any way inaccurate, out of context, incomplete or unavailable.


This work is licensed under the Creative Commons Attribution-NonCommercial-NoDerivatives V4.0 International License

You are free to copy and communicate the work in its current form for non-commercial purposes, as long as you attribute the State of Queensland, Queensland Ambulance Service and comply with the licence terms. If you alter the work, you may not share or distribute the modified work. To view a copy of this license, visit [http://creativecommons.org/licenses/by-nc-nd/4.0/deed.en](http://creativecommons.org/licenses/by-nc-nd/4.0/deed.en)

For copyright permissions beyond the scope of this license please contact: Clinical.Guidelines@ambulance.qld.gov.au
Drug class
Gas

Pharmacology
A colourless, odourless gas essential for the production of cellular energy.

Metabolism
N/A.

Indications
- A wide range of conditions resulting in, or potentially resulting in systemic and/or localised hypoxia or hypoxaemia as listed in tables 1–4 of this DTP.

Contraindications
- Known paraquat poisoning with SpO₂ ≥ 88
- History of bleomycin therapy with SpO₂ ≥ 88

Precautions
- Patients with paraquat poisoning or bleomycin lung injury may be harmed by supplemental oxygen. Avoid oxygen unless the patient is hypoxaemic – target SpO₂ 88–92%
- Prolonged administration to premature neonates

Side effects
- Hypoventilation in some COPD patients with hypoxic drive.
- Drying of airway mucous membranes

Oxygen
Oxygen

Presentation

- Size C Cylinder, 450 L *medical oxygen*
- Size D Cylinder, 1600 L *medical oxygen*

## Onset | Duration | Half-life
--- | --- | ---
Immediate | N/A | N/A

Special notes [1–5]

- Ambulance officers must only administer medications for the listed indications and dosing range. Any consideration for treatment outside the listed scope of practice requires mandatory approval via the QAS Clinical Consult and Advice Line.
- The administration of oxygen to correct hypoxaemia is evidence based. Severe hypoxaemia is harmful.[1]
- Diving accidents are NOT covered by this DTP – officers are to administer high flow oxygen.
- QAS oxygen saturation monitors are unable to differentiate between carboxyhaemoglobin and oxyhaemoglobin, therefore patients with carbon monoxide poisoning are to be administered the maximum oxygen dose irrespective of SpO2 readings.
- If a patient with COPD sustains or develops a critical illness/injury, the target saturation for the patient’s critical illness takes priority *(see Table 1)*
- For patients with COPD, nebulised salbutamol is to be delivered via nebuliser mask at a rate of 6 L/minute. For all other patients 8 L/minute is appropriate for nebulising drugs.

Schedule

- Unscheduled.

## Routes of administration

### Inhalation (INH)

- Nasal cannulae (NC)
- Nebuliser mask (NEB)
- Simple face mask (SFM)
- Non-rebreather reservoir mask (NRBM)
- Bag-valve mask (BVM)
- Laryngeal mask airway (LMA)
- Endotracheal tube (ETT)
**Adult dosages**

### Critical illness requiring HIGH levels of supplemental oxygen (See Table 1)

| INH | 15 L/minute (BVM/NRBM) – BVM is only to be used if the patient requires positive pressure ventilation. Administer until the vital signs are normal, then adjust flow to aim for a target SpO₂ of 94–98%.

### Conditions requiring CONTROLLED or LOW DOSE oxygen therapy (See Table 3)

| INH | 2–4 L/minute (NC) | Administer until a reliable SpO₂ measurement is available then adjust flow to aim for a target SpO₂ of 88–92%. If SpO₂ remains < 88% increase oxygen flow to 5–10 L/minute (SFM) to aim for a target SpO₂ of 88–92%.

### Serious illness with hypoxaemia requiring MODERATE levels of supplemental oxygen (See Table 2)

| INH | SpO₂ < 85%: 15 L/minute (NRBM) | Administer until a reliable SpO₂ measurement is available then adjust flow to aim for a target SpO₂ of 94–98%.

| INH | SpO₂ ≥ 85 – 93%: 2–4 L/minute (NC) OR 5–10 L/minute (SFM) | Administer until a reliable SpO₂ measurement is available then adjust flow to aim for a target SpO₂ of 94–98%.

### Oxygenation monitoring required however oxygen therapy is not required unless the patient is hypoxaemic (See Table 4)

| INH | SpO₂ < 85%–15 L/minute (NRBM) | Administer until a reliable SpO₂ measurement is available then adjust flow to aim for a target SpO₂ of 94–98%.

| INH | 2–4 L/minute (NC) OR 5–10 L/minute (SFM) | Administer until a reliable SpO₂ measurement is available then adjust flow to aim for a target SpO₂ of 94–98%.
Paediatric dosages

**Significant illness AND/OR injury**

<table>
<thead>
<tr>
<th>FR</th>
<th>P1O</th>
<th>AT</th>
<th>P</th>
<th>CCP</th>
</tr>
</thead>
<tbody>
<tr>
<td>INH</td>
<td>15 L/minute (BVM/NRBM) – BVM is only to be used if the patient requires positive pressure ventilation.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 1** – Critical illnesses in adults requiring **HIGH** levels of supplemental oxygen

- Cardiac arrest OR resuscitation
- Shock
- Sepsis
- Major trauma
- Trauma in pregnancy
- Near-drowning
- Anaphylaxis
- Major pulmonary haemorrhage
- Major head injury
- Carbon monoxide poisoning
- Active seizure
- Hyperkalaemia

**Table 2** – Serious illness in adults requiring **MODERATE** levels of supplemental oxygen

- Acute hypoxaemia (cause unknown)
- Acute asthma
- Pneumonia
- Lung cancer
- Post-operative breathlessness
- Acute heart failure
- Pulmonary embolism
- Pleural effusion/s
- Deterioration of lung fibrosis or other interstitial lung disease
- Severe anaemia
- Pneumothorax
- Sickle cell crisis

**Table 3** – COPD and other conditions in adults requiring **CONTROLLED** or low dose supplemental oxygen oxygen

- COPD
- Exacerbation of cystic fibrosis
- Chronic neuromuscular disorders
- Chest wall disorders
- Morbid obesity

**Table 4** – Conditions in adults **NOT** requiring supplemental oxygen unless the patient is hypoxaemic

- AMI/ACS
- Pregnancy and obstetric emergencies
- Stroke
- Headache
- Post convulsion
- Abdominal pain
- Hyperventilation or dysfunctional breathing
- Most poisonings and drug overdoses (excluding carbon monoxide poisoning – refer to Table 1)
- Poisoning with paraquat OR bleomycin use
- Metabolic and renal disorders
- Acute or subacute neurological and muscular conditions producing muscle weakness
- Glycaemic emergencies
- Heat exhaustion/stroke
- Cardiac rhythm disturbances
- Non-traumatic chest pain
- ICD firing
- GI haemorrhage
ADULT OXYGEN ADMINISTRATION ALGORITHM

- **Known or suspected carbon monoxide poisoning?**
  - **N**
  - **Y**

- **Known or suspected paraquat poisoning?**
  - **N**
  - **Y**

- **Critical illness requiring **HIGH** levels of O2?** *(Refer to Table 1)*
  - **N**
  - **Y**

- **Serious illness requiring **MODERATE** levels of O2?** *(Refer to Table 2)*
  - **N**
  - **Y**

- **Conditions requiring **CONTROLLED** or **LOW DOSE** levels of O2?** *(Refer to Table 3)*
  - **N**
  - **Y**

- **Other conditions NOT requiring O2 unless hypoxaemic** *(Refer to Table 4)*
  - **N**
  - **Y**

**15 L/min (BVM/NRBM)**

- **Monitor SpO2. If saturations fall below 88%, administer the minimum amount of O2 to maintain a target SpO2 88–92%**
  - **SpO2 is < 85% administer 15 L/min (NRBM). SpO2 85–87% administer 2–6 L/min (NC) OR 5–10 L/min (SFM) – target SpO2 88–92%**
  - **Monitor SpO2. If saturations fall below 94%, administer O2 to maintain a target SpO2 > 93%**
  - **Administer the maximum O2 dose (BVM/NRBM) until the vital signs are normal, then reduce O2 and aim for a target SpO2 > 93%**
  - **Monitor SpO2. If saturations fall below 94%, administer O2 to maintain a target SpO2 > 93%**
  - **Monitor SpO2. If saturations fall below 88%, administer O2 to maintain a target SpO2 88–92%**
  - **If SpO2 < 85%, administer 10–15 L/min (NRBM). If SpO2 85–93%, administer 2–4 L/min (NC) OR 5–10 L/min (SFM) – target SpO2 > 93%**

---